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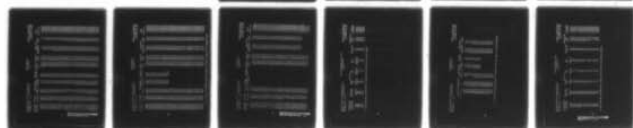
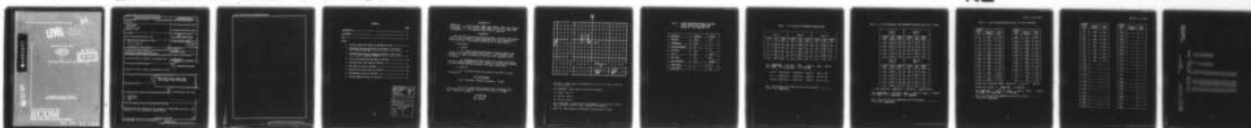
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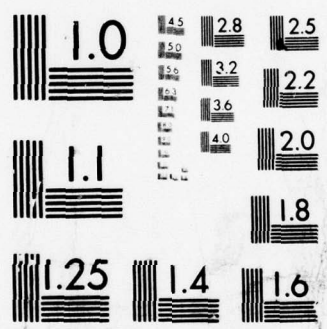
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NATIONAL BUREAU OF STANDARDS-1963-A

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May 1979

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METEOROLOGICAL DATA REPORT

19305A GSRS  
Missile No. 1033  
Round No. V-36  
31 May 1979

by

White Sands Meteorological Team

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ATMOSPHERIC SCIENCES LABORATORY  
WHITE SANDS MISSILE RANGE, NEW MEXICO

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UNITED STATES ARMY ELECTRONICS COMMAND

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|--|---|---|
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| 4. TITLE (and Subtitle)<br>19305A GSRS<br>Missile No. 1033<br>Round No. V-36   | 5. TYPE OF REPORT & PERIOD COVERED  |   |
| 7. AUTHOR(s)<br>White Sands Meteorological Team  | 6. PERFORMING ORG. REPORT NUMBER  |   |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS<br>(12) 17 P.  | 8. CONTRACT OR GRANT NUMBER(s)<br>DA Task IT665702D126-02                 |   |
| 11. CONTROLLING OFFICE NAME AND ADDRESS<br>US Army Electronics Research & Development Comd<br>Atmospheric Sciences Laboratory<br>White Sands Missile Range, New Mexico   | 10. PROGRAM ELEMENT, PROJECT, TASK<br>AREA & WORK UNIT NUMBERS<br>(17) 02 |   |
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| 18. SUPPLEMENTARY NOTES  |   |   |
| 19. KEY WORDS (Continue on reverse side if necessary and identify by block number)<br>1. Ballistics<br>2. Meteorology<br>3. Wind<br>(9) Meteorological data rept.  |   |   |
| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number)<br>Meteorological data gathered for the launching of 19305A GSRS, Missile No. 1033,<br>Round No. V-36, are presented in tabular form.<br>420 663 |   |   |



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| REPORT DOCUMENTATION PAGE                        |   |
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## INTRODUCTION

19305A GSRS, Missile Number 1032, Round Number V-36, was launched from LC-33, White Sands Missile Range (WSMR), New Mexico, at 1310 MDT, 31 May 1979. The scheduled launch time was 1310 MDT.

## DISCUSSION

Meteorological data were recorded and reduced by the White Sands Meteorological Team, Atmospheric Sciences Laboratory (ASL), White Sands Missile Range, New Mexico. The data were obtained by the following methods:

### 1. Observations

#### a. Surface

(1) Standard surface observations to include pressure, temperature ( $^{\circ}\text{C}$ ), relative humidity, dew point ( $^{\circ}\text{C}$ ), density ( $\text{gm}/\text{m}^3$ ), wind direction and speed, and cloud cover were made at the LC-33 Met Site at T-0 minutes.

(2) Anemometer data were provided from existing pole-mounted and tower-mounted anemometers at LC-33. Monitor of wind speed and direction from one anemometer was also provided in the launch control room.

#### b. Upper Air

(1) Low level wind data were obtained from RAPTS T-9 pilot observation at:

## SITE AND ALTITUDE

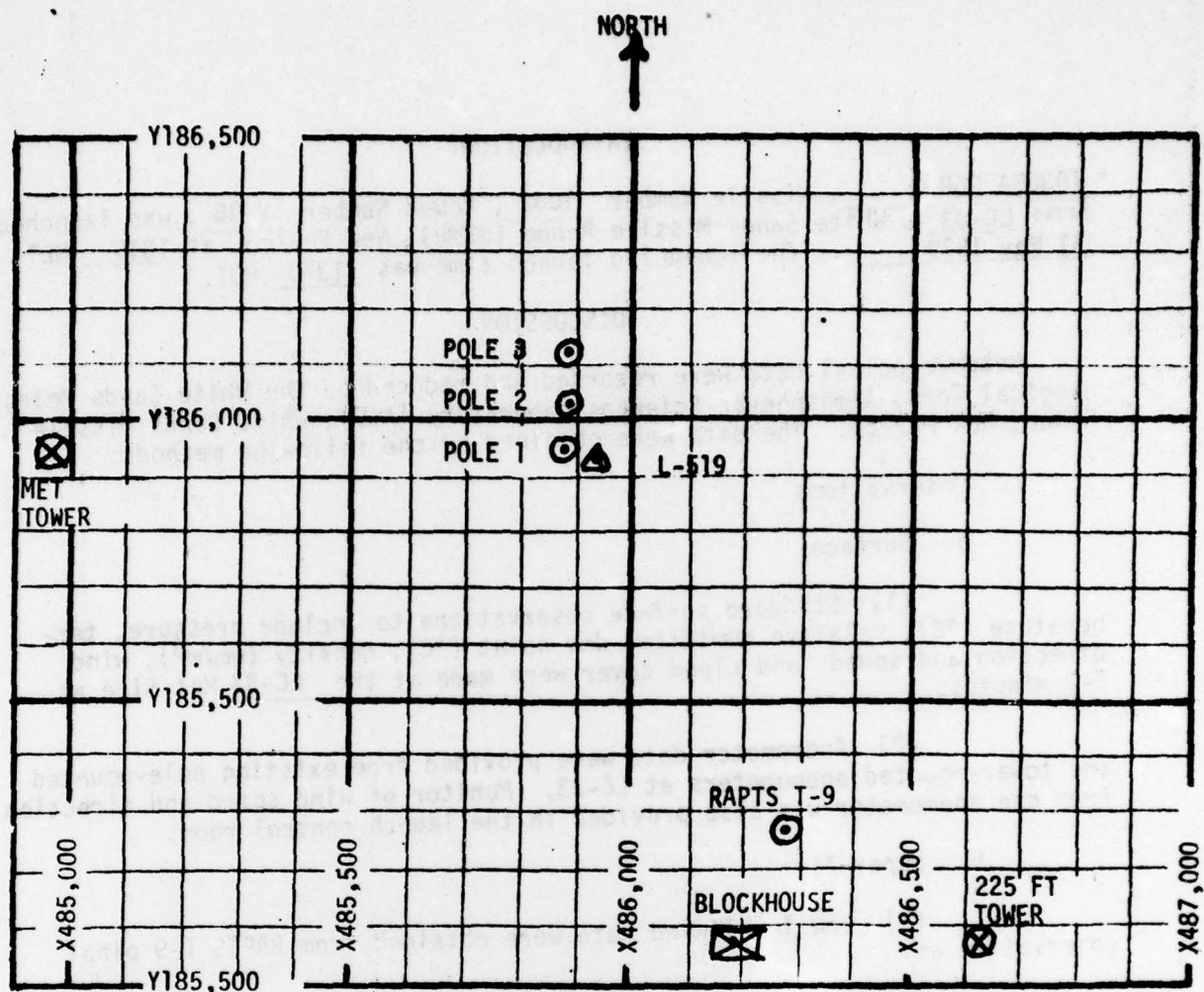
LC-33 1020 meters (30-meter increments) 1310 MDT

(2) Air structure data (rawinsonde) were collected at the following Met Sites. Data were collected from surface to 62,500 feet in 500-foot increments.

## SITE AND TIME

SMR 1125 MST





1. MET TOWER - 4 Bendix Model T-120 Anemometers at 12 ft, 62 ft, 102 ft and 202 ft with E/A recorders.
2. POLE ANEMOMETER - Bendix Model T-120 with E/A recorders.
  - (a) Pole #1 - 38.7 ft
  - (b) Pole #2 - 53.0 ft
  - (c) Pole #3 - 83.6 ft
3. 225 FT WIND TOWER - 5 Bendix Model T-120 Anemometers at 35 ft, 88 ft, 128 ft, 168 ft and 200 ft with 5 X-Y visual indicators in Blockhouse.
4. RAPTS T-9 - Radar Automatic Pilot-Balloon Tracking System T-9 Radar



TABLE 1. SURFACE OBSERVATIONS TAKEN AT 1310 MDT,  
31 MAY 1979 AT LC-33, 19305A GSRS,  
MISSILE NO. 1033, ROUND NO. V-36

|                   |         |                   |
|-------------------|---------|-------------------|
| ELEVATION         | 3977.30 | FT/MSL            |
| PRESSURE          | 877.8   | MBS               |
| TEMPERATURE       | 32.2    | °C                |
| RELATIVE HUMIDITY | 24      | %                 |
| DEW POINT         | 9.0     | °C                |
| DENSITY           | 994     | GM/M <sup>3</sup> |
| WIND SPEED        | 05      | MPH               |
| WIND DIRECTION    | 075     | DEGREES           |
| CLOUD COVER       | 2       | Cu                |
| CLOUD COVER       | 1       | TCu               |

TABLE 2. LC-33 FIXED POLE ANEMOMETER-MEASURED WINDS

| POLE #1       |            |              | POLE #2       |            |              | POLE #3       |            |              |
|---------------|------------|--------------|---------------|------------|--------------|---------------|------------|--------------|
| T-TIME<br>SEC | DIR<br>DEG | SPEED<br>MPH | T-TIME<br>SEC | DIR<br>DEG | SPEED<br>MPH | T-TIME<br>SEC | DIR<br>DEG | SPEED<br>MPH |
| -30           | 102        | 10           | -30           | 096        | 10           | -30           | 108        | M            |
| -20           | 094        | 10           | -20           | 101        | 10           | -20           | 108        | M            |
| -10           | 093        | 09           | -10           | 093        | 09           | -10           | 105        | 13           |
| 0.0           | 084        | 07           | 0.0           | 092        | 10           | 0.0           | 105        | 10           |
| +10           | 092        | 06           | +10           | 073        | 08           | +10           | 103        | 11           |

Type 19305A GSRS, Missile No. 1033, Round No. V-36 launched  
from LC-33 on 31 May 1979 at 1310 MDT.

POLE #1 = X485,874.29 Y185,958.90 H4018.74 38.7 ft. AGL

POLE #2 = X485,874.93 Y186,012.00 H4033.57 53.0 ft. AGL

POLE #3 = X485,877.29 Y186,116.06 H4063.92 83.6 ft. AGL

NOTE: Wind directions are referenced to the firing azimuth \_\_\_\_\_  
or true north true north.

TABLE 3. LC-33 METEOROLOGICAL TOWER ANEMOMETER-MEASURED WINDS (202 FT. TOWER)

| LEVEL #1<br>12 ft.  |            |              | LEVEL #2<br>62 ft.  |            |              |
|---------------------|------------|--------------|---------------------|------------|--------------|
| T-TIME<br>SEC       | DIR<br>DEG | SPEED<br>MPH | T-TIME<br>SEC       | DIR<br>DEG | SPEED<br>MPH |
| -30                 | 157        | 08           | -30                 | 133        | 10           |
| -20                 | 157        | 09           | -20                 | 147        | 09           |
| -10                 | 157        | 11           | -10                 | 146        | 11           |
| 0.0                 | 147        | 08           | 0.0                 | 159        | 10           |
| +10                 | 168        | 08           | +10                 | 150        | 08           |
| LEVEL #3<br>102 ft. |            |              | LEVEL #4<br>202 ft. |            |              |
| T-TIME<br>SEC       | DIR<br>DEG | SPEED<br>MPH | T-TIME<br>SEC       | DIR<br>DEG | SPEED<br>MPH |
| -30                 | 146        | 10           | -30                 | 135        | 06           |
| -20                 | 142        | 07           | -20                 | 102        | 06           |
| -10                 | 142        | 06           | -10                 | 117        | 05           |
| 0.0                 | 168        | 07           | 0.0                 | 135        | 06           |
| +10                 | 166        | 08           | +10                 | 146        | 06           |

WTSM Coordinates: X484,982.64 Y185,957.73 H3983.00 (base)

Type 19305A GSRS, Missile No. 1033, Round No. V-36 launched  
from LC-33 on 31 May 1979 at 1310 MDT.

NOTE: Wind directions are referenced to the firing azimuth \_\_\_\_\_  
or true north true north.



TABLE 4. PILOT-BALLOON-MEASURED WIND DATA (30-METER INCREMENTS)

| HEIGHT<br>METERS<br>AGL | DIRECTION<br>DEGREES | SPEED<br>MPH |
|-------------------------|----------------------|--------------|
| SFC                     | 075                  | 5.0          |
| 30                      | 123                  | 3.0          |
| 60                      | 171                  | 0.5          |
| 90                      | 112                  | 3.5          |
| 120                     | 052                  | 6.0          |
| 150                     | 066                  | 8.0          |
| 180                     | 080                  | 9.5          |
| 210                     | 074                  | 8.5          |
| 240                     | 068                  | 7.5          |
| 270                     | 075                  | 9.0          |
| 300                     | 081                  | 10.0         |
| 330                     | 084                  | 10.5         |
| 360                     | 086                  | 11.0         |

| HEIGHT<br>METERS<br>AGL | DIRECTION<br>DEGREES | SPEED<br>MPH |
|-------------------------|----------------------|--------------|
| 390                     | 077                  | 10.0         |
| 420                     | 068                  | 9.0          |
| 450                     | 072                  | 6.5          |
| 480                     | 076                  | 4.0          |
| 510                     | 100                  | 3.5          |
| 540                     | 123                  | 3.0          |
| 570                     | 104                  | 3.5          |
| 600                     | 085                  | 4.0          |
| 630                     | 127                  | 4.5          |
| 660                     | 168                  | 4.5          |
| 690                     | 163                  | 4.5          |
| 720                     | 158                  | 4.5          |
| 750                     | 147                  | 4.0          |

Release Point Coordinates (WSTM): X486,037.24 Y486,037.24 H3977.30

Released from LC-33 on 31 May 1979 at 1310 MDT.Type 19305A GSRS, Missile No. 1033, Round No. V-36 launched from LC-33 on 31 May 1979 at 1310 MDT.NOTE: Wind directions are referenced to the firing azimuth \_\_\_\_\_ or true north true north.

| HEIGHT<br>METERS<br>AGL | DIRECTION<br>DEGREES | SPEED<br>MPH |
|-------------------------|----------------------|--------------|
| 780                     | 136                  | 3.0          |
| 810                     | 133                  | 4.5          |
| 840                     | 130                  | 5.5          |
| 870                     | 127                  | 6.0          |
| 900                     | 123                  | 6.0          |
| 930                     | 123                  | 6.5          |
| 960                     | 123                  | 6.5          |
| 990                     | 133                  | 6.5          |
| 1020                    | 142                  | 6.5          |
| 1050                    |                      |              |
| 1080                    |                      |              |
| 1110                    |                      |              |
| 1140                    |                      |              |
| 1170                    |                      |              |
| 1200                    |                      |              |
| 1230                    |                      |              |
| 1260                    |                      |              |
| 1290                    |                      |              |
| 1320                    |                      |              |
| 1350                    |                      |              |
| 1380                    |                      |              |
| 1410                    |                      |              |

| HEIGHT<br>METERS<br>AGL | DIRECTION<br>DEGREES | SPEED<br>MPH |
|-------------------------|----------------------|--------------|
| 1440                    |                      |              |
| 1470                    |                      |              |
| 1500                    |                      |              |
| 1530                    |                      |              |
| 1560                    |                      |              |
| 1590                    |                      |              |
| 1620                    |                      |              |
| 1650                    |                      |              |
| 1680                    |                      |              |
| 1710                    |                      |              |
| 1740                    |                      |              |
| 1770                    |                      |              |
| 1800                    |                      |              |
| 1830                    |                      |              |
| 1860                    |                      |              |
| 1890                    |                      |              |
| 1920                    |                      |              |
| 1950                    |                      |              |
| 1980                    |                      |              |
| 2010                    |                      |              |
| 2040                    |                      |              |
| 2070                    |                      |              |

STATION ALTITUDE 3997.30 FEET MSL  
31 MAY 79 1125 HRS MST  
ASCENSION NO. 161

SIGNIFICANT LEVEL DATA  
1510060161  
S M R

GEODETIC COORDINATES  
32.48034 LAT DEG  
106.42307 LON DEG

| PRESSURE  | GEOMETRIC ALTITUDE | TEMPERATURE        | REL. HUM. |
|-----------|--------------------|--------------------|-----------|
| MILLIBARS | MSL FEET           | AIR DEWPOINT       | PERCENT   |
|           |                    | DEGREES CENTIGRADE |           |
| 875.9     | 3997.3             | 29.7               | 29.0      |
| 864.3     | 4418.0             | 25.6               | 28.0      |
| 850.0     | 4898.5             | 24.6               | 27.0      |
| 810.3     | 6266.0             | 20.6               | 54.0      |
| 777.6     | 7422.7             | 18.0               | 24.0      |
| 705.0     | 10341.0            | 9.8                | 39.0      |
| 590.3     | 14809.8            | -2.9               | 63.0      |
| 522.8     | 18016.2            | -9.3               | 15.0      |
| 503.0     | 19144.4            | -11.6              | 15.0      |
| 458.3     | 20764.4            | -14.6              | 22.0      |
| 409.8     | 24058.1            | -22.4              | 23.0      |
| 400.0     | 24842.1            | -23.3              | 20.0      |
| 374.6     | 26193.5            | -26.8              | 16.0      |
| 317.2     | 30037.9            | -36.7              | 25.0      |
| 303.0     | 31341.1            | -40.7              |           |
| 282.6     | 32655.6            | -43.9              |           |
| 250.0     | 35350.8            | -49.1              |           |
| 233.8     | 36791.2            | -51.5              |           |
| 200.0     | 40107.0            | -54.7              |           |
| 191.3     | 41043.5            | -55.3              |           |
| 167.3     | 41483.5            | -54.6              |           |
| 161.8     | 42666.6            | -56.0              |           |
| 150.0     | 43145.7            | -58.4              |           |
| 128.3     | 49371.9            | -60.4              |           |
| 104.6     | 53454.5            | -68.2              |           |
| 100.0     | 54384.7            | -67.5              |           |
| 91.8      | 56037.9            | -66.9              |           |
| 88.8      | 56753.9            | -64.7              |           |
| 75.3      | 59276.6            | -66.9              |           |
| 70.0      | 61516.9            | -65.9              |           |
| 65.2      | 62955.0            | -61.5              |           |



GEODETIC COORDINATES  
32.48034 LAT DEG  
106.42307 LON DEG

UPPER AIR DATA  
1510060161  
S M R

STATION ALTITUDE 3997.30 FEET MSL  
31 MAY 79 1125 HRS MST  
ASCENSION NO. 101

| GEODETIC ALTITUDE<br>MSL FEET | PRESSURE<br>MILLIBARS | TEMPERATURE<br>AIR DEGREES<br>C | TEMPERATURE<br>DEWPOINT<br>C | REL. HUM.<br>PERCENT | DENSITY<br>GM/CUBIC<br>METER | SPEED OF<br>SOUND<br>KNOTS | WIND DATA<br>DIRECTION<br>DEGREES (TN) | SPEED<br>KNOTS | INDEX<br>OF<br>REFRACTION |
|-------------------------------|-----------------------|---------------------------------|------------------------------|----------------------|------------------------------|----------------------------|--|----------------|---------------------------|
| 3997.3                        | 876.9                 | 29.7                            | 9.8                          | 29.0                 | 1003.4                       | 679.7                      | 0                                      | 0              | 1.000274                  |
| 4000.0                        | 876.8                 | 29.7                            | 9.7                          | 29.0                 | 1003.4                       | 679.7                      | 27.9                                   | 0              | 1.000274                  |
| 4500.0                        | 861.8                 | 25.4                            | 5.5                          | 27.8                 | 1001.6                       | 674.5                      | 27.9                                   | 1.2            | 1.000262                  |
| 5000.0                        | 847.0                 | 24.3                            | 5.1                          | 29.0                 | 988.1                        | 673.2                      | 27.9                                   | 2.4            | 1.000258                  |
| 5500.0                        | 832.3                 | 22.8                            | 8.1                          | 38.9                 | 974.8                        | 671.9                      | 27.9                                   | 3.6            | 1.000264                  |
| 6000.0                        | 817.9                 | 21.4                            | 10.2                         | 49.7                 | 961.8                        | 670.5                      | 27.2                                   | 3.6            | 1.000269                  |
| 6500.0                        | 803.6                 | 20.1                            | 8.7                          | 47.9                 | 949.7                        | 668.9                      | 24.8                                   | 2.3            | 1.000261                  |
| 7000.0                        | 789.5                 | 19.0                            | 3.2                          | 35.0                 | 938.1                        | 667.1                      | 24.9                                   | 1.2            | 1.000243                  |
| 7500.0                        | 775.6                 | 17.8                            | -2.3                         | 24.4                 | 926.5                        | 665.3                      | 105.6                                  | .3             | 1.000229                  |
| 8000.0                        | 761.8                 | 16.4                            | -2.7                         | 27.0                 | 914.3                        | 663.7                      | 145.6                                  | 2.0            | 1.000226                  |
| 8500.0                        | 743.1                 | 15.0                            | -2.6                         | 29.5                 | 902.2                        | 662.1                      | 143.7                                  | 4.1            | 1.000224                  |
| 9000.0                        | 734.7                 | 13.6                            | -2.7                         | 32.1                 | 890.4                        | 660.5                      | 140.3                                  | 5.6            | 1.000221                  |
| 9500.0                        | 721.6                 | 12.2                            | -2.9                         | 34.7                 | 878.8                        | 659.9                      | 145.3                                  | 7.8            | 1.000219                  |
| 10000.0                       | 708.7                 | 10.8                            | -3.2                         | 37.2                 | 867.3                        | 657.3                      | 151.3                                  | 8.7            | 1.000216                  |
| 10500.0                       | 695.8                 | 9.4                             | -3.6                         | 39.8                 | 855.9                        | 655.8                      | 159.6                                  | 8.7            | 1.000213                  |
| 11000.0                       | 682.9                 | 8.0                             | -4.0                         | 42.5                 | 844.2                        | 654.0                      | 168.8                                  | 8.8            | 1.000210                  |
| 11500.0                       | 670.3                 | 6.6                             | -4.5                         | 45.1                 | 832.7                        | 652.4                      | 167.7                                  | 8.6            | 1.000207                  |
| 12000.0                       | 657.8                 | 5.2                             | -5.0                         | 47.8                 | 821.4                        | 650.7                      | 179.7                                  | 8.7            | 1.000204                  |
| 12500.0                       | 645.6                 | 3.8                             | -5.6                         | 50.4                 | 810.2                        | 649.1                      | 170.3                                  | 9.5            | 1.000200                  |
| 13000.0                       | 633.6                 | 2.4                             | -6.2                         | 53.0                 | 799.3                        | 647.4                      | 179.7                                  | 10.6           | 1.000197                  |
| 13500.0                       | 621.9                 | 1.0                             | -6.9                         | 55.7                 | 788.5                        | 645.7                      | 190.7                                  | 12.4           | 1.000194                  |
| 14000.0                       | 610.3                 | .4                              | -7.6                         | 58.3                 | 777.9                        | 644.1                      | 200.8                                  | 15.1           | 1.000191                  |
| 14500.0                       | 599.0                 | -1.3                            | -8.3                         | 60.9                 | 767.4                        | 642.4                      | 200.8                                  | 18.4           | 1.000188                  |
| 15000.0                       | 587.8                 | -3.1                            | -9.5                         | 61.3                 | 755.9                        | 640.8                      | 212.6                                  | 21.4           | 1.000184                  |
| 15500.0                       | 576.5                 | -4.1                            | -12.1                        | 53.6                 | 745.4                        | 639.5                      | 210.3                                  | 24.3           | 1.000179                  |
| 16000.0                       | 565.4                 | -5.2                            | -15.0                        | 46.0                 | 734.1                        | 638.1                      | 219.5                                  | 26.4           | 1.000174                  |
| 16500.0                       | 554.5                 | -6.2                            | -18.1                        | 38.3                 | 722.9                        | 636.8                      | 222.4                                  | 28.3           | 1.000169                  |
| 17000.0                       | 543.8                 | -7.2                            | -21.6                        | 30.6                 | 711.9                        | 635.5                      | 224.5                                  | 28.9           | 1.000164                  |
| 17500.0                       | 533.4                 | -8.2                            | -25.7                        | 22.9                 | 701.1                        | 634.2                      | 226.6                                  | 29.4           | 1.000160                  |
| 18000.0                       | 523.1                 | -9.3                            | -30.9                        | 15.2                 | 690.4                        | 633.0                      | 230.6                                  | 30.4           | 1.000156                  |
| 18500.0                       | 512.9                 | -10.4                           | -31.9                        | 15.0                 | 679.7                        | 631.8                      | 234.3                                  | 31.5           | 1.000154                  |
| 19000.0                       | 502.9                 | -11.5                           | -32.9                        | 15.0                 | 669.3                        | 630.3                      | 236.5                                  | 31.8           | 1.000151                  |
| 19500.0                       | 492.9                 | -12.5                           | -32.7                        | 16.5                 | 658.5                        | 629.1                      | 238.5                                  | 31.2           | 1.000149                  |
| 20000.0                       | 483.2                 | -13.4                           | -32.2                        | 18.7                 | 647.8                        | 628.0                      | 239.9                                  | 26.5           | 1.000147                  |
| 20500.0                       | 473.6                 | -14.3                           | -31.8                        | 20.8                 | 637.2                        | 626.9                      | 240.1                                  | 22.9           | 1.000144                  |
| 21000.0                       | 464.2                 | -15.3                           | -32.1                        | 22.1                 | 626.9                        | 625.7                      | 236.9                                  | 21.3           | 1.000142                  |
| 21500.0                       | 454.8                 | -16.5                           | -33.0                        | 22.2                 | 617.1                        | 624.3                      | 231.4                                  | 21.7           | 1.000140                  |
| 22000.0                       | 445.7                 | -17.6                           | -33.9                        | 22.4                 | 607.4                        | 622.8                      | 225.1                                  | 23.8           | 1.000137                  |
| 22500.0                       | 436.7                 | -18.8                           | -34.9                        | 22.5                 | 597.9                        | 621.4                      | 220.8                                  | 24.7           | 1.000135                  |
| 23000.0                       | 427.9                 | -19.9                           | -35.8                        | 22.7                 | 583.5                        | 620.0                      | 210.5                                  | 25.5           | 1.000133                  |

STATION ALTITUDE 3997.30 FEET MSL  
 31 MAY 79 1125 HRS MST  
 ASCENSION NO. 161

UPPER AIR DATA  
 1510060161  
 S M R

GEODETIC COORDINATES  
 32.48034 LAT DEG  
 106.42307 LON DEG

| GEOMETRIC ALTITUDE<br>FEET | PRESSURE<br>MILLIBARS | TEMPERATURE<br>AIR DEGREES<br>CELSIUS | REL. HUM.<br>PERCENT | DENSITY<br>GRAMS PER<br>CUBIC METER | SPEED OF<br>SOUND<br>KNOTS | WIND DATA<br>DIRECTION,<br>DEGREES (TN) | WIND<br>SPEED<br>KNOTS | INDEX<br>OF<br>REFRACTION |
|----------------------------|-----------------------|---------------------------------------|----------------------|-------------------------------------|----------------------------|---|------------------------|---------------------------|
| 23500.0                    | 419.2                 | -21.1                                 | 22.8                 | 579.3                               | 618.6                      | 216.1                                   | 26.3                   | 1.000131                  |
| 24000.0                    | 416.8                 | -22.3                                 | 23.0                 | 570.3                               | 617.1                      | 216.4                                   | 27.1                   | 1.000128                  |
| 24500.0                    | 402.4                 | -23.1                                 | 20.7                 | 560.4                               | 616.1                      | 219.6                                   | 27.1                   | 1.000126                  |
| 25000.0                    | 394.1                 | -24.1                                 | 19.1                 | 551.1                               | 614.8                      | 224.3                                   | 27.0                   | 1.000124                  |
| 25500.0                    | 385.9                 | -25.2                                 | 17.8                 | 542.2                               | 613.5                      | 227.1                                   | 27.2                   | 1.000122                  |
| 26000.0                    | 377.9                 | -26.4                                 | 16.5                 | 533.4                               | 612.1                      | 229.1                                   | 27.5                   | 1.000120                  |
| 26500.0                    | 370.0                 | -27.6                                 | 16.7                 | 524.8                               | 610.5                      | 229.1                                   | 27.1                   | 1.000118                  |
| 27000.0                    | 362.1                 | -28.9                                 | 17.9                 | 516.3                               | 608.9                      | 229.8                                   | 26.9                   | 1.000116                  |
| 27500.0                    | 354.4                 | -30.2                                 | 19.1                 | 508.1                               | 607.3                      | 231.5                                   | 26.9                   | 1.000114                  |
| 28000.0                    | 346.9                 | -31.4                                 | 20.2                 | 499.9                               | 605.7                      | 231.8                                   | 27.7                   | 1.000112                  |
| 28500.0                    | 339.5                 | -32.7                                 | 21.4                 | 491.9                               | 604.1                      | 231.2                                   | 29.2                   | 1.000110                  |
| 29000.0                    | 332.3                 | -34.0                                 | 22.6                 | 484.1                               | 602.5                      | 229.6                                   | 29.9                   | 1.000108                  |
| 29500.0                    | 325.2                 | -35.3                                 | 23.7                 | 476.3                               | 600.8                      | 227.6                                   | 30.1                   | 1.000107                  |
| 30000.0                    | 318.3                 | -36.6                                 | 24.9                 | 468.8                               | 599.2                      | 226.5                                   | 29.4                   | 1.000105                  |
| 30500.0                    | 311.4                 | -38.1                                 | 16.1**               | 461.5                               | 597.3                      | 225.8                                   | 28.3                   | 1.000103                  |
| 31000.0                    | 304.6                 | -39.7                                 | 6.5**                | 454.4                               | 595.3                      | 225.2                                   | 27.5                   | 1.000101                  |
| 31500.0                    | 297.9                 | -41.1                                 |                      | 447.1                               | 593.5                      | 224.6                                   | 26.9                   | 1.000100                  |
| 32000.0                    | 291.3                 | -42.3                                 |                      | 439.5                               | 591.9                      | 223.8                                   | 26.9                   | 1.000098                  |
| 32500.0                    | 284.8                 | -43.5                                 |                      | 432.0                               | 590.3                      | 223.0                                   | 27.3                   | 1.000096                  |
| 33000.0                    | 278.4                 | -44.6                                 |                      | 424.3                               | 589.0                      | 223.4                                   | 28.1                   | 1.000094                  |
| 33500.0                    | 272.1                 | -45.5                                 |                      | 416.4                               | 587.8                      | 225.2                                   | 29.5                   | 1.000093                  |
| 34000.0                    | 265.9                 | -46.5                                 |                      | 408.7                               | 586.5                      | 227.6                                   | 31.2                   | 1.000091                  |
| 34500.0                    | 259.9                 | -47.5                                 |                      | 401.2                               | 585.3                      | 231.4                                   | 34.1                   | 1.000089                  |
| 35000.0                    | 254.0                 | -48.4                                 |                      | 393.8                               | 584.0                      | 234.7                                   | 37.2                   | 1.000086                  |
| 35500.0                    | 248.3                 | -49.3                                 |                      | 386.5                               | 582.8                      | 235.7                                   | 37.7                   | 1.000086                  |
| 36000.0                    | 242.6                 | -50.2                                 |                      | 379.0                               | 581.7                      | 236.6                                   | 38.2                   | 1.000084                  |
| 36500.0                    | 237.0                 | -51.0                                 |                      | 371.7                               | 580.6                      | 235.9                                   | 37.4                   | 1.000083                  |
| 37000.0                    | 231.5                 | -51.7                                 |                      | 364.2                               | 579.7                      | 237.4                                   | 36.1                   | 1.000081                  |
| 37500.0                    | 226.1                 | -52.2                                 |                      | 356.5                               | 579.1                      | 237.4                                   | 35.2                   | 1.000079                  |
| 38000.0                    | 220.9                 | -52.7                                 |                      | 349.0                               | 578.5                      | 238.8                                   | 35.0                   | 1.000078                  |
| 38500.0                    | 215.7                 | -53.1                                 |                      | 341.6                               | 577.8                      | 240.1                                   | 34.9                   | 1.000076                  |
| 39000.0                    | 210.7                 | -53.6                                 |                      | 334.4                               | 577.2                      | 240.8                                   | 35.5                   | 1.000074                  |
| 39500.0                    | 205.8                 | -54.1                                 |                      | 327.3                               | 576.6                      | 241.5                                   | 36.0                   | 1.000073                  |
| 40000.0                    | 201.0                 | -54.6                                 |                      | 320.4                               | 575.9                      | 242.2                                   | 36.1                   | 1.000071                  |
| 40500.0                    | 196.3                 | -55.0                                 |                      | 313.4                               | 575.5                      | 242.9                                   | 35.9                   | 1.000070                  |
| 41000.0                    | 191.7                 | -55.3                                 |                      | 306.5                               | 575.0                      | 243.6                                   | 35.4                   | 1.000068                  |
| 41500.0                    | 187.2                 | -54.6                                 |                      | 298.4                               | 573.9                      | 244.7                                   | 34.0                   | 1.000066                  |
| 42000.0                    | 182.8                 | -54.3                                 |                      | 291.7                               | 573.6                      | 245.6                                   | 32.7                   | 1.000065                  |
| 42500.0                    | 178.5                 | -55.1                                 |                      | 285.1                               | 573.3                      | 246.5                                   | 32.0                   | 1.000064                  |
| 43000.0                    | 174.3                 | -55.3                                 |                      | 278.7                               | 573.0                      | 247.1                                   | 31.6                   | 1.000062                  |

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

GEODETIC COORDINATES  
32°48034 LAT DEG  
106°42307 LON DEG

UPPER AIR DATA  
1510060101  
S M R

STATION ALTITUDE 3997.30 FEET MSL  
31 MAY 79 1125 HRS MST  
ASCENSION NO 161

| GEOMETRIC ALTITUDE<br>MSL FEET | PRESSURE<br>MILLIBARS | TEMPERATURE<br>AIR DEGREES<br>DEWPOINT CENTIGRADE | REL. HUM.<br>PERCENT | DENSITY<br>GM/CUBIC<br>METER | SPEED OF<br>SOUND<br>KNOTS | WIND DATA<br>DIRECTION DEGREES (TN)<br>SPEED KNOTS | INDEX<br>OF<br>REFRACTION |
|--------------------------------|-----------------------|---|----------------------|------------------------------|----------------------------|--|---------------------------|
| 3500.0                         | 170.2                 | -35.5   |                      | 272.5                        | 574.7                      | 247.9  | 1.000061                  |
| 3400.0                         | 166.2                 | -55.7   |                      | 266.3                        | 574.4                      | 249.2  | 1.000059                  |
| 4300.0                         | 162.5                 | -56.0   |                      | 260.4                        | 574.1                      | 250.7  | 1.000058                  |
| 4500.0                         | 158.5                 | -56.7   |                      | 255.0                        | 573.2                      | 251.1  | 1.000057                  |
| 4500.0                         | 154.7                 | -57.4   |                      | 249.8                        | 572.2                      | 251.3  | 1.000056                  |
| 4600.0                         | 151.1                 | -58.2   |                      | 244.8                        | 571.2                      | 251.0  | 1.000055                  |
| 4600.0                         | 147.4                 | -58.6   |                      | 239.4                        | 570.5                      | 250.1  | 1.000053                  |
| 4700.0                         | 143.9                 | -53.9   |                      | 234.0                        | 570.2                      | 249.3  | 1.000052                  |
| 4750.0                         | 140.5                 | -59.2   |                      | 228.8                        | 569.8                      | 248.1  | 1.000051                  |
| 4800.0                         | 137.1                 | -59.5   |                      | 223.6                        | 569.4                      | 247.0  | 1.000050                  |
| 4850.0                         | 133.8                 | -59.9   |                      | 218.6                        | 569.0                      | 246.7  | 1.000049                  |
| 4900.0                         | 130.6                 | -60.2   |                      | 213.7                        | 568.5                      | 247.3  | 1.000048                  |
| 4950.0                         | 127.5                 | -60.6   |                      | 209.0                        | 567.9                      | 247.8  | 1.000047                  |
| 5000.0                         | 124.4                 | -61.6   |                      | 204.8                        | 566.8                      | 246.9  | 1.000046                  |
| 5050.0                         | 121.3                 | -62.6   |                      | 200.7                        | 565.4                      | 250.0  | 1.000045                  |
| 5100.0                         | 118.4                 | -63.5   |                      | 196.7                        | 564.1                      | 250.2  | 1.000044                  |
| 5150.0                         | 115.5                 | -64.5   |                      | 192.7                        | 562.6                      | 249.0  | 1.000043                  |
| 5200.0                         | 112.6                 | -65.4   |                      | 188.9                        | 561.5                      | 247.6  | 1.000042                  |
| 5250.0                         | 109.9                 | -66.4   |                      | 185.1                        | 560.2                      | 247.1  | 1.000041                  |
| 5300.0                         | 107.2                 | -67.3   |                      | 181.4                        | 558.9                      | 246.7  | 1.000040                  |
| 5350.0                         | 104.6                 | -68.2   |                      | 177.7                        | 557.5                      | 246.0  | 1.000040                  |
| 5400.0                         | 102.0                 | -67.8   |                      | 173.0                        | 556.3                      | 243.1  | 1.000039                  |
| 5450.0                         | 99.4                  | -67.5   |                      | 168.4                        | 555.0                      | 240.0  | 1.000038                  |
| 5500.0                         | 97.0                  | -67.3   |                      | 164.1                        | 559.0                      | 237.2  | 1.000037                  |
| 5550.0                         | 94.5                  | -67.1   |                      | 159.9                        | 559.2                      | 234.4  | 1.000036                  |
| 5600.0                         | 92.2                  | -65.9   |                      | 155.8                        | 559.4                      | 231.3  | 1.000035                  |
| 5650.0                         | 89.9                  | -65.5   |                      | 150.9                        | 561.3                      | 231.5  | 1.000034                  |
| 5700.0                         | 87.7                  | -64.9   |                      | 146.7                        | 562.2                      | 232.1  | 1.000033                  |
| 5750.0                         | 85.6                  | -65.4   |                      | 143.4                        | 561.6                      | 232.9  | 1.000032                  |
| 5800.0                         | 83.4                  | -65.8   |                      | 140.2                        | 561.0                      | 232.9  | 1.000031                  |
| 5850.0                         | 81.4                  | -66.2   |                      | 137.0                        | 560.4                      | 232.9  | 1.000031                  |
| 5900.0                         | 79.4                  | -66.7   |                      | 133.9                        | 559.8                      | 232.9  | 1.000030                  |
| 5950.0                         | 77.4                  | -66.8   |                      | 130.7                        | 559.0                      | 232.9  | 1.000029                  |
| 6000.0                         | 75.5                  | -66.6   |                      | 127.4                        | 559.9                      | 232.9  | 1.000028                  |
| 6050.0                         | 73.7                  | -66.4   |                      | 124.1                        | 560.2                      |  | 1.000028                  |
| 6100.0                         | 71.8                  | -66.1   |                      | 120.9                        | 560.5                      |  | 1.000027                  |
| 6150.0                         | 70.1                  | -65.9   |                      | 117.8                        | 560.8                      |  | 1.000026                  |
| 6200.0                         | 68.4                  | -64.4   |                      | 114.1                        | 562.8                      |  | 1.000025                  |
| 6250.0                         | 66.7                  | -62.9   |                      | 110.5                        | 564.9                      |  | 1.000025                  |



STATION ALTITUDE 3997.30 FEET MSL  
 31 MAY 79 1125 HRS MST  
 ASCENSION NO. 101

MRN SIGNIFICANT LEVEL DATA  
 1510060161  
 S M R

GEODETIC COORDINATES  
 32.48034 LAT DEG  
 106.42307 LON DEG

| GEOPOTENTIAL<br>ALTITUDE<br>DECAMETERS | DIRECTION<br>DEG (TN) | WIND DATA    |            | E-W<br>MPS | DEW PT DEP<br>DEG C | TEMPERATURE  |         | PRESSURE<br>MILLIBARS |
|--|-----------------------|--------------|------------|------------|---------------------|--------------|---------|-----------------------|
|  |                       | SPEED<br>MPS | N-S<br>MPS |            |                     | AIR<br>DEG C |         |                       |
| 1912.                                  | 9999.**               | 9999.**      | -9999.**   | -9999.**   | 99                  | -61.5        | 6.520+1 |                       |
| 1869.                                  | 9999.**               | 9999.**      | -9999.**   | -9999.**   | 99                  | -65.9        | 7.000+1 |                       |
| 1801.                                  | 233.                  | 12.          | 7.         | 9.         | 99                  | -66.9        | 7.830+1 |                       |
| 1724.                                  | 232.                  | 12.          | 8.         | 10.        | 99                  | -64.7        | 8.880+1 |                       |
| 1704.                                  | 231.                  | 13.          | 8.         | 10.        | 99                  | -66.9        | 9.180+1 |                       |
| 1653.                                  | 241.                  | 16.          | 8.         | 14.        | 99                  | -67.5        | 1.000+2 |                       |

\*\* WIND DATA NOT COMPUTED DUE TO MISSING RAW AZIMUTH AND ELEVATION ANGLES.

STATION ALTITUDE 997.30 FEET MSL  
31 MAY 79 1125 HRS MST  
ASCENSION NO. 101

MANDATORY LEVELS  
1510060161  
S M R

GEODETIC COORDINATES  
32.48034 LAT DEG  
106.42307 LON DEG

| PRESSURE GEOPOTENTIAL |        | TEMPERATURE    |                         | REL. HUM.<br>PERCENT | WIND DATA                |                |
|-----------------------|--------|----------------|-------------------------|----------------------|--------------------------|----------------|
| MILLIBARS             | FEET   | AIR<br>DEGREES | DEW POINT<br>CENTIGRADE |                      | DIRECTION<br>DEGREES(TN) | SPEED<br>KNOTS |
| 850.0                 | 4825.  | 24.6           | 4.4                     | 27.                  | 27.9                     | 2.2            |
| 800.0                 | 6624.  | 19.8           | 7.4                     | 45.                  | 24.3                     | 2.0            |
| 750.0                 | 8432.  | 15.2           | -2.6                    | 29.                  | 144.5                    | 3.8            |
| 700.0                 | 10331. | 9.8            | -3.5                    | 39.                  | 156.8                    | 6.7            |
| 650.0                 | 12331. | 4.3            | -5.4                    | 44.                  | 159.9                    | 9.2            |
| 600.0                 | 14447. | -1.7           | -8.3                    | 61.                  | 207.5                    | 18.1           |
| 550.0                 | 16698. | -6.6           | -19.5                   | 35.                  | 223.3                    | 28.6           |
| 500.0                 | 19117. | -11.8          | -33.1                   | 15.                  | 237.1                    | 31.8           |
| 450.0                 | 21739. | -17.1          | -33.5                   | 24.                  | 228.0                    | 22.7           |
| 400.0                 | 24601. | -23.3          | -39.9                   | 20.                  | 220.8                    | 27.1           |
| 350.0                 | 27760. | -30.9          | -46.5                   | 20.                  | 232.1                    | 27.1           |
| 300.0                 | 31279. | -40.7          |                         |                      | 224.8                    | 27.1           |
| 250.0                 | 35274. | -49.1          |                         |                      | 235.4                    | 37.5           |
| 200.0                 | 40010. | -54.7          |                         |                      | 242.3                    | 36.1           |
| 175.0                 | 42810. | -55.2          |                         |                      | 247.0                    | 31.7           |
| 150.0                 | 46021. | -58.4          |                         |                      | 250.8                    | 29.0           |
| 125.0                 | 49763. | -61.4          |                         |                      | 248.6                    | 35.4           |
| 100.0                 | 54217. | -67.5          |                         |                      | 240.9                    | 30.6           |
| 80.0                  | 58653. | -66.5          |                         |                      | 232.9                    | 21.8           |
| 70.0                  | 61390. | -65.9          |                         |                      |                          |                |

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

| STATION ALTITUDE 3997.30 FEET MSL<br>31 MAY 79 1125 HRS MST<br>ASCENSION NO. 101 |                       | MRN MANDATORY LEVELS<br>1510060161<br>S M R |                         | GEODEIC COORDINATES<br>32.48034 LAT DEG<br>106.42307 LON DEG |                     |                             |                       |
|--|-----------------------|---|-------------------------|--|---------------------|-----------------------------|-----------------------|
| GEOPOTENTIAL<br>ALTITUDE<br>METERS   | DIRECTION<br>DEG (TH) | SPEED<br>MPS                                | WIND DATA<br>N-S<br>MPS | E-W<br>MPS   | DEW PT DEP<br>DEG C | TEMPERATURE<br>AIR<br>DEG C | PRESSURE<br>MILLIBARS |
| 169.   | 9999.**               | 9999.**                                     | -9999.**                | -9999.**   | 99                  | -65.9                       | 7.000+1               |
| 178.   | 233.                  | 11.   | 7.                      | 9.   | 99                  | -66.5                       | 8.000+1               |
| 183.   | 241.                  | 16.   | 8.                      | 14.  | 99                  | -67.5                       | 1.000+2               |
| 191.   | 249.                  | 18.   | 7.                      | 17.  | 99                  | -61.4                       | 1.250+2               |
| 193.   | 251.                  | 15.   | 5.                      | 14.  | 99                  | -58.4                       | 1.500+2               |
| 199.   | 247.                  | 16.   | 6.                      | 15.  | 99                  | -55.2                       | 1.750+2               |
| 1220.  | 242.                  | 19.   | 9.                      | 16.  | 99                  | -54.7                       | 2.000+2               |
| 1075.  | 235.                  | 19.   | 11.                     | 16.  | 99                  | -49.1                       | 2.500+2               |
| 953.   | 225.                  | 14.   | 10.                     | 10.  | 99                  | -40.7                       | 3.000+2               |
| 840.   | 232.                  | 14.   | 9.                      | 11.  | 16                  | -30.9                       | 3.500+2               |
| 750.   | 221.                  | 14.   | 11.                     | 9.   | 17                  | -23.3                       | 4.000+2               |
| 603.   | 229.                  | 12.   | 8.                      | 9.   | 16                  | -17.1                       | 4.500+2               |
| 583.   | 237.                  | 16.   | 9.                      | 14.  | 21                  | -11.8                       | 5.000+2               |
| 509.   | 223.                  | 15.   | 11.                     | 10.  | 13                  | -6.6                        | 5.500+2               |
| 440.   | 207.                  | 9.  | 8.                      | 4.   | 07                  | -1.7                        | 6.000+2               |
| 370.   | 170.                  | 5.  | 5.                      | -1.  | 10                  | 4.3                         | 6.500+2               |
| 315.   | 157.                  | 4.  | 4.                      | -2.  | 13                  | 9.8                         | 7.000+2               |
| 257.   | 144.                  | 2.  | 2.                      | -1.  | 18                  | 15.2                        | 7.500+2               |
| 202.   | 24.                   | 1.  | -1.                     | -0.  | 12                  | 19.8                        | 8.000+2               |
| 149.   | 28.                   | 1.  | -1.                     | -1.  | 20                  | 24.6                        | 8.500+2               |

\*\* WIND DATA NOT COMPUTED DUE TO MISSING RAW AZIMUTH AND ELEVATION ANGLES.